

## REQUEST FOR ACCESS OF ABANDONED APPLICATION UNDER 37 CFR 1.14(a)

PROCESSED BY

AUG 12 1997

FIII

In re Application of

Harari et al.

Application Number

337,566

Filed

4-13-89

Group Art Unit

Examiner

Assistant Commissioner for Patents  
Washington, DC 20231

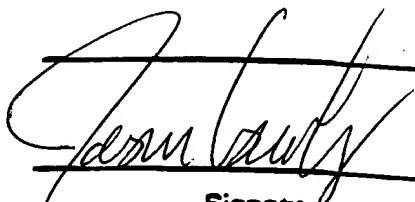
Paper No. #19

I hereby request access under 37 CFR 1.14(a)(3)(iv) to the application file record of the above-identified ABANDONED application, which is: (CHECK ONE)

- ☒ (A) referred to in United States Patent Number 5,602,987, column \_\_\_\_\_
- ☐ (B) referred to in an application that is open to public inspection as set forth in 37 CFR 1.11, i.e., Application No. \_\_\_\_\_, filed \_\_\_\_\_, on page \_\_\_\_\_ of paper number \_\_\_\_\_
- ☐ (C) an application that claims the benefit of the filing date of an application that is open to public inspection, i.e., Application No. \_\_\_\_\_, filed \_\_\_\_\_, or
- ☐ (D) an application in which the applicant has filed an authorization to lay open the complete application to the public.

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# United States Patent [19]

Harari et al.

[11] Patent Number: 5,602,987

[45] Date of Patent: Feb. 11, 1997

## [54] FLASH EEPROM SYSTEM

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[73] Assignee: SanDisk Corporation, Sunnyvale, Calif.

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[21] Appl. No.: 174,768

[22] Filed: Dec. 29, 1993

## Related U.S. Application Data

[60] Continuation of Ser. No. 963,838, Oct. 20, 1992, Pat. No. 5,297,148, which is a division of Ser. No. 337,566, Apr. 13, 1989, abandoned.

[51] Int. Cl.<sup>6</sup> G06F 11/00

[52] U.S. Cl. 395/182.06; 365/200; 365/210; 395/427

[58] Field of Search 371/10.2, 10.3, 371/40.1; 365/200, 185.09, 201, 189.07; 395/575, 182.03, 182.04, 182.05, 182.06, 427, 430

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## [57] ABSTRACT

A system of Flash EEprom memory chips with controlling circuits serves as non-volatile memory such as that provided by magnetic disk drives. Improvements include selective multiple sector erase, in which any combinations of Flash sectors may be erased together. Selective sectors among the selected combination may also be de-selected during the erase operation. Another improvement is the ability to remap and replace defective cells with substitute cells. The remapping is performed automatically as soon as a defective cell is detected. When the number of defects in a Flash sector becomes large, the whole sector is remapped. Yet another improvement is the use of a write cache to reduce the number of writes to the Flash EEprom memory, thereby minimizing the stress to the device from undergoing too many write/erase cycling.

50 Claims, 5 Drawing Sheets

